

Evaluation and policy learning: toward a new approach to the evaluation of social impacts of public research activities



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A changing context

- Research impacts as a new dimension of the contract between science and society (e.g. Nightingale & Scott, 2007) → **consider ‘broader’ impacts beyond scientific ones.**
- Connects with a longstanding tradition in Europe looking at ‘socio-economic’ impacts of programmes (e.g. evaluation of space programmes, or evaluation of EC R&T programmes)
- Two new requirements...
 - move from programmes to **organisations** (e.g. the new UK REF)
 - in broader impacts, consider other than economic impacts: social, environmental, political, cultural
- ... drive to new developments, e.g. multi-criteria approaches (payback framework, Health impact assessment..).
- Links to the renewed interest by policymakers about ‘the science of science and innovation policy’ (NSF programme, EC PRIME network...)

The ASIRPA project in context



- One policy caution: the problems raised by synthetic financial measures
 - some dimensions are difficult to translate in financial benefits
 - a synthetic measure tells nothing about content (where and how) which is central for policy learning
- Thus the will of a French PRO, INRA*, to support the development of an approach with 3 characteristics: taking a broad view of impacts, combining qualitative and quantitative methods, well inserted in the international world of evaluation 'science'.
- ASIRPA stands for 'socio-economic analysis of the diversity of impacts of public research for agriculture'

A note in passing: remember the role of agriculture in key developments on the role of research (Griliches 1958) or the first books on the diffusion of innovations (Rogers, 1962)

Preamble: 3 'constraints' to consider



- Evaluation is taken as a periodic strategic practice feeding an open debate on future policy orientations
→ The approach requires to be repeated at regular intervals, and thus portable (a 'strong' issue for qualitative methods)
- Impact assessment (other than on S&T) is only one of the dimensions of evaluation → Attention has to be given to its articulation with other dimensions of evaluation, their internal robustness and the conditions of their 'uptake'
- Impact assessment deals with effective effects on society
i.e. looks at past research activities mobilised into 'innovation processes':
entails long time delays between research outputs (e.g. scientific articles) and effects (e.g. REF considers up to 12 years)
→ Face the risk of being only a legitimization effort and conservative (*'we were good yesterday, so fund us tomorrow'*)

The approach: 3 stages and 8 considerations



1. Taking into account the observed skewed distribution of effects → focusing on cases that generate the core of impacts
2. Develop a standardised method for case analysis organised around 3 key considerations, each driving to a corresponding tool (impact pathway, productive configuration and impact vector)
3. Moving from impacts at case level to impacts of the organisation: a step by step approach privileging aggregation per type of effects and physical indicators.

Stage 1: INRA 'portfolio' & the selection of cases (1)



- Starting point: observed skewed distribution of impacts
see for agriculture Maredia & Raitzer (2006): *Benefit of 1 innovation (cassava mealybug) represents 80% of CGIAR impact in sub-Saharan Africa & economic return (9 billion\$) exceeded CGIAR total investment in Africa since 1971*
- Consequence: focus on 'activities with a high impact'
- Critical issue: tools & procedures to "move from the organisation to cases"
- Supportive instrument: building INRA's portfolio of impact generating activities
 - INRA long-lasting DB of 'faits marquants' (prominent facts): over 1000 dealing with impact since 1996.
 - Method developed to translate 'speeches' into a set of basic variables describing the type of outputs, of beneficiaries and of impacts (Gaunand et al. 2012)
 - 7 major 'impact configurations' identified to take into consideration when discussing activities having generated high impact

Stage 1: INRA 'portfolio' & the selection of cases (2)



- Selection process: using in-depth interviews with mid-level hierarchy (heads of the 14 departments of INRA)
- Warning: The skewed distribution at INRA level might not be relevant for all 'impact configurations'. This drives to also consider in these configurations, 'exemplary' cases.
- Output: a dataset of some 50 'activities' considered as having generated high or exemplary impacts, and 6+12 cases selected for an initial test
- A note of caution: over-administration danger!
Do not develop 'ex ante' processes that are relevant for only 1% of the activities supported. Keep it 'ex-post'.

Stage 2: 'standardised case studies – shaped by 3 considerations

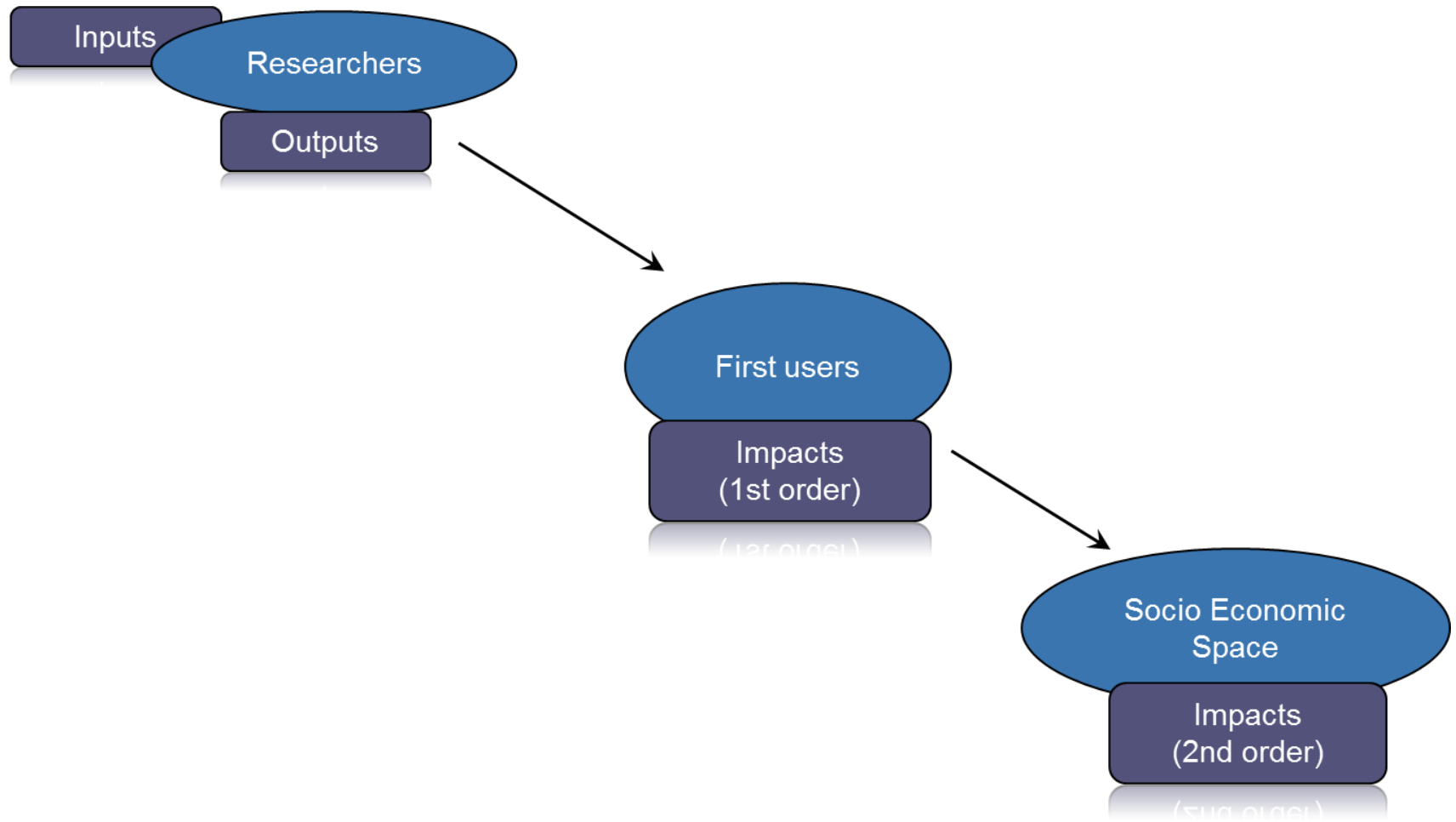
- C2: impact as the consequence of the intervention of a network of actors
- C3: beware of project fallacy
- C4: account for the plurality of impacts

C2: Impact as the outcome of the activities of a network of heterogeneous actors

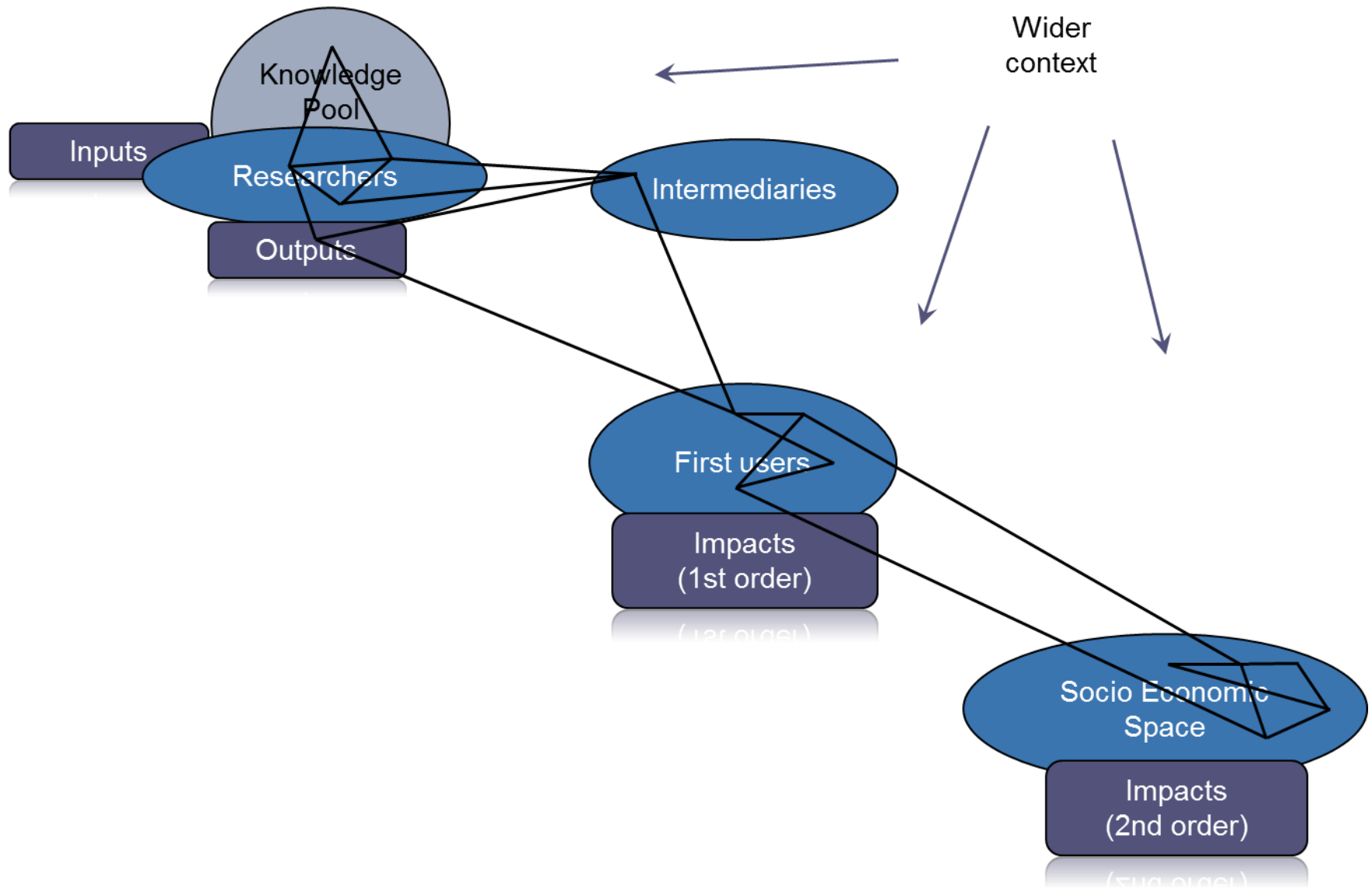


- Concepts converge to highlight the variety of actors involved in innovation processes: TEN (Callon), DIP (Green), Open innovation (Chesbrough)...
- Consequences: impacts characterised are those generated by the network
- Shifting the focus: what is the overall process through which the impact has been generated, and what is the position and role of INRA within it
- Links to the debate on attribution vs contribution (Spaapen et al. (2011) and our hand on it: postpone attribution issues for the third stage about aggregation
- Tool for standardising it: 'impact pathway'
 - developed in the agronomic world (Douthwaite et al., 2003, CGIAR 2008)

CGIAR stylisation of impact pathway



ASIRPA revised visualisation of impact pathway



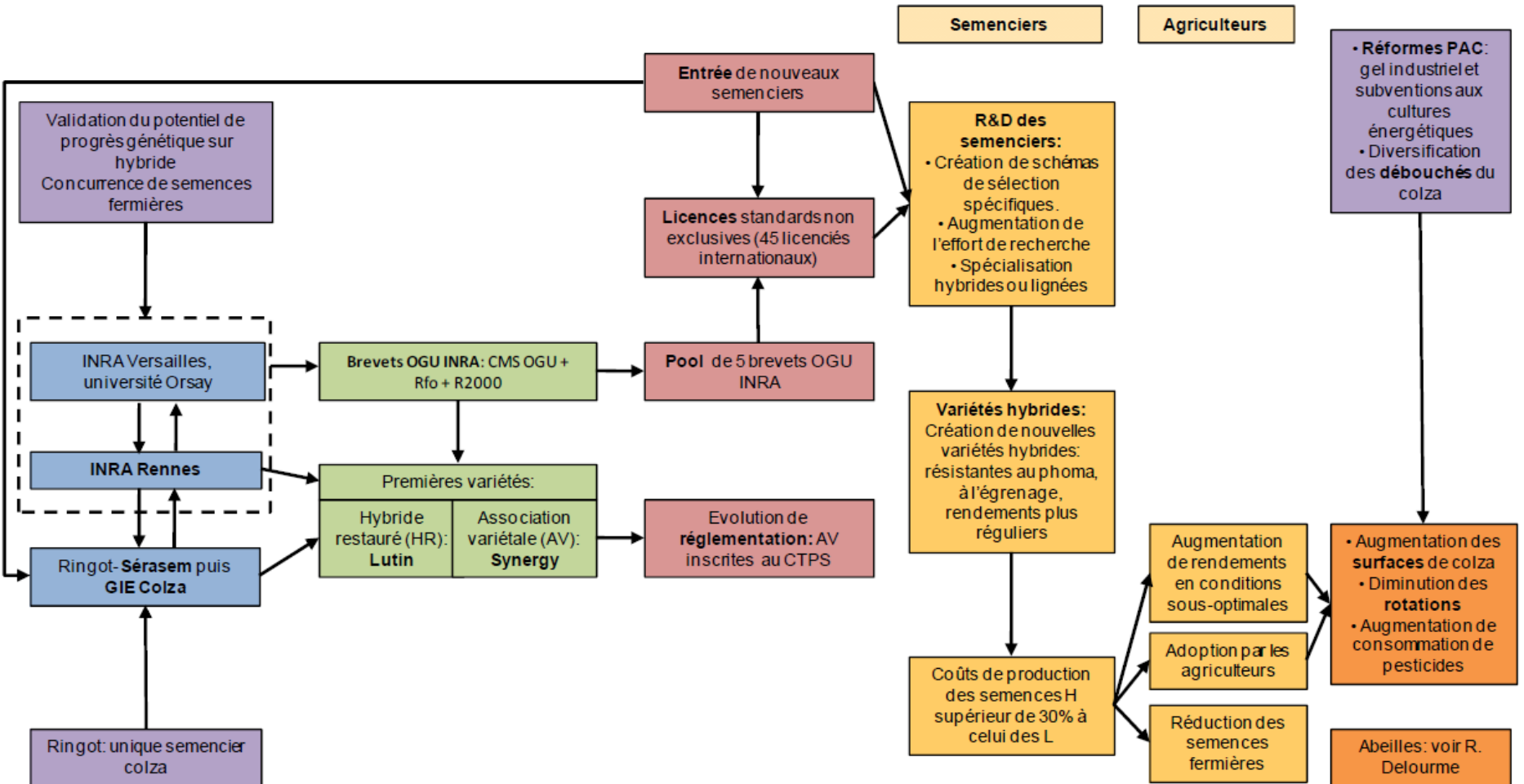
Revised impact pathways: key aspects



- Consider multi-directional processes and multiple iterations within each stage and between stages
- No longer keep the terminology of outcomes and impacts
 - potential 'policy' misunderstandings.
 - capturing the notions of initial deployment with a core set of involved actors and wider diffusion (or generalisation)
→ 2 options: first and second order impacts, or direct and 'broader' impacts
- Do not restrict the cognitive aspects to the sole participants, take into account the knowledge 'pool'/ communities (Nedeva 2010)
- Innovation processes are context dependent (the organisation as such, the related industries, the institutional environment)

OGU-INRA

CONTEXTE



INPUTS

OUTPUTS

INTERMEDIAIRES

IMPACTS NIVEAU 1

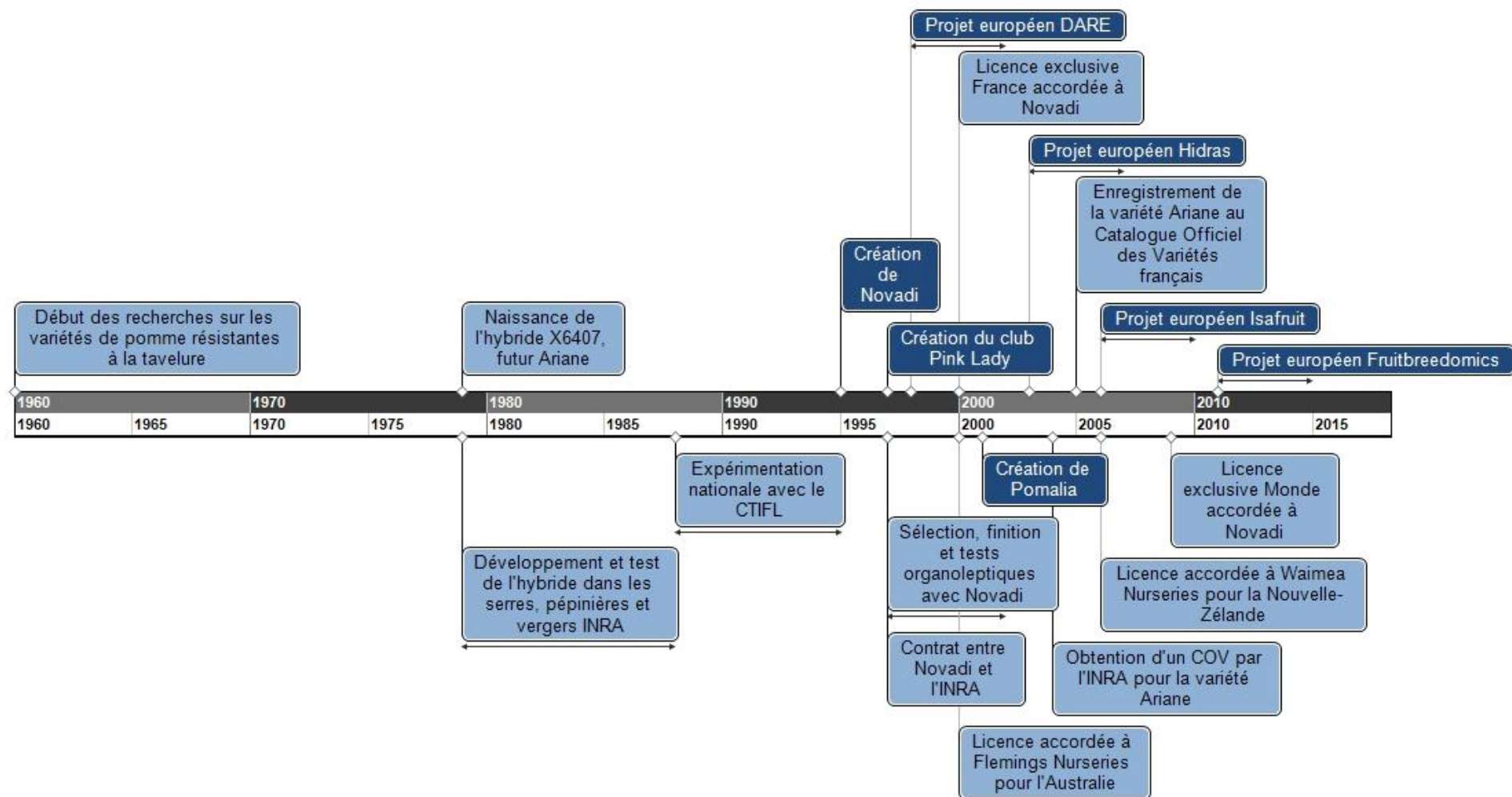
IMPACTS NIVEAU 2

C3: beware of project fallacy

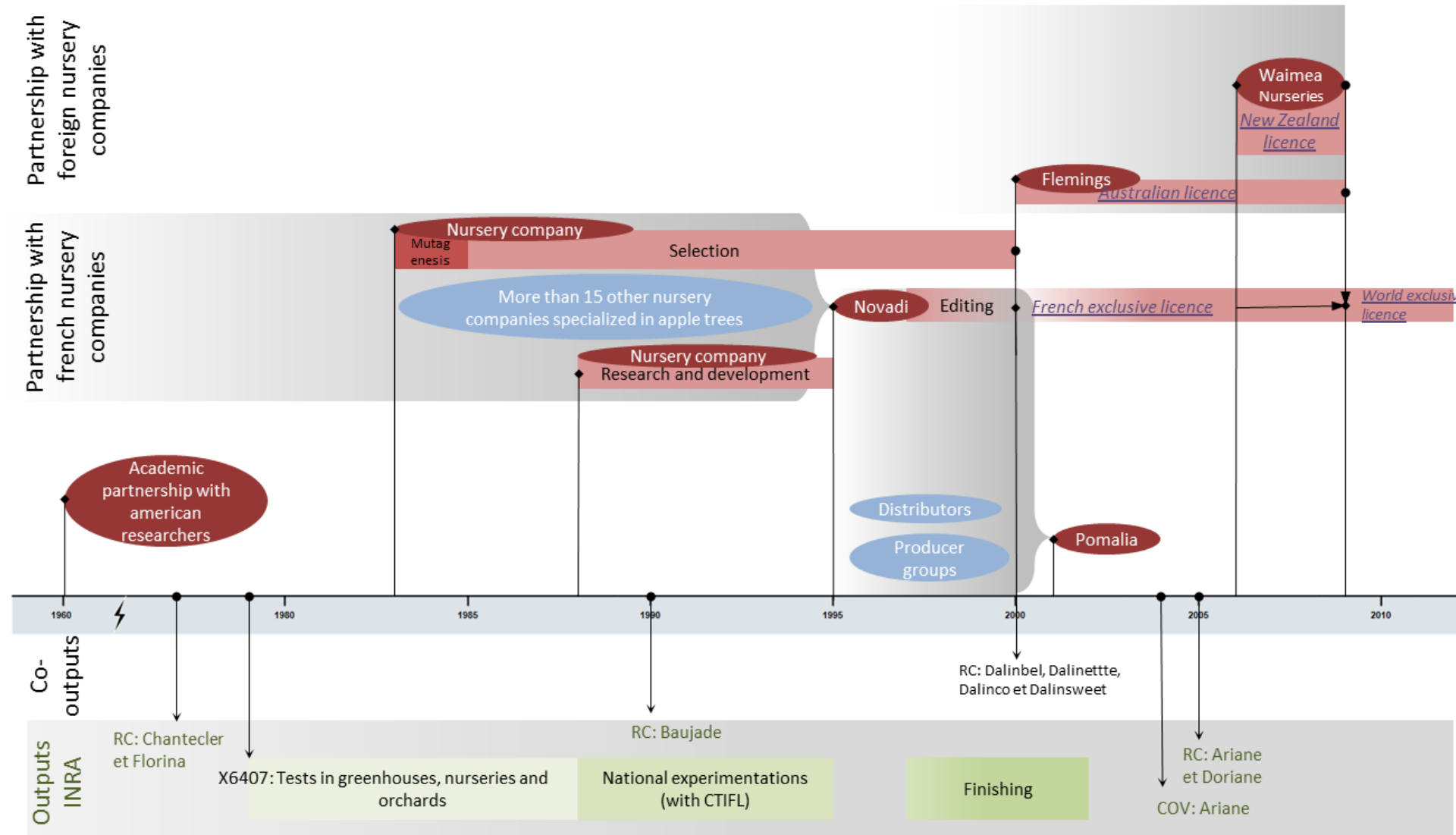


- A central result of programme evaluation: ‘activities’ start before the funded project, often go beyond project partnership and end far after the funding phase (Georghiou, 2002)
- Consequences for accounting of research activities: consider the ‘productive configuration’ of research activities:
 - Account for long-term engagement of research collectives
 - Be attentive to the realm of actors involved (and in particular ‘internal’ and ‘external’ collaborations)
 - take into account HR circulation (e.g. shifting positions of PhD over time)
- Tool for standardising it: chronologies (complemented by estimates of HR mobilised over time) – key events, involvement of actors (evolution of the network over time)

A new scab resistant apple: Ariane key events



ARIANE Apple actor network



ARIANE Apple: actor network



Légende



Partnership duration and agreement

Ariane apple's selection steps

RC: Registration in the French official
catalogue of varieties

Other actors no direct
partnership with INRA

C4: account for the plurality of impacts

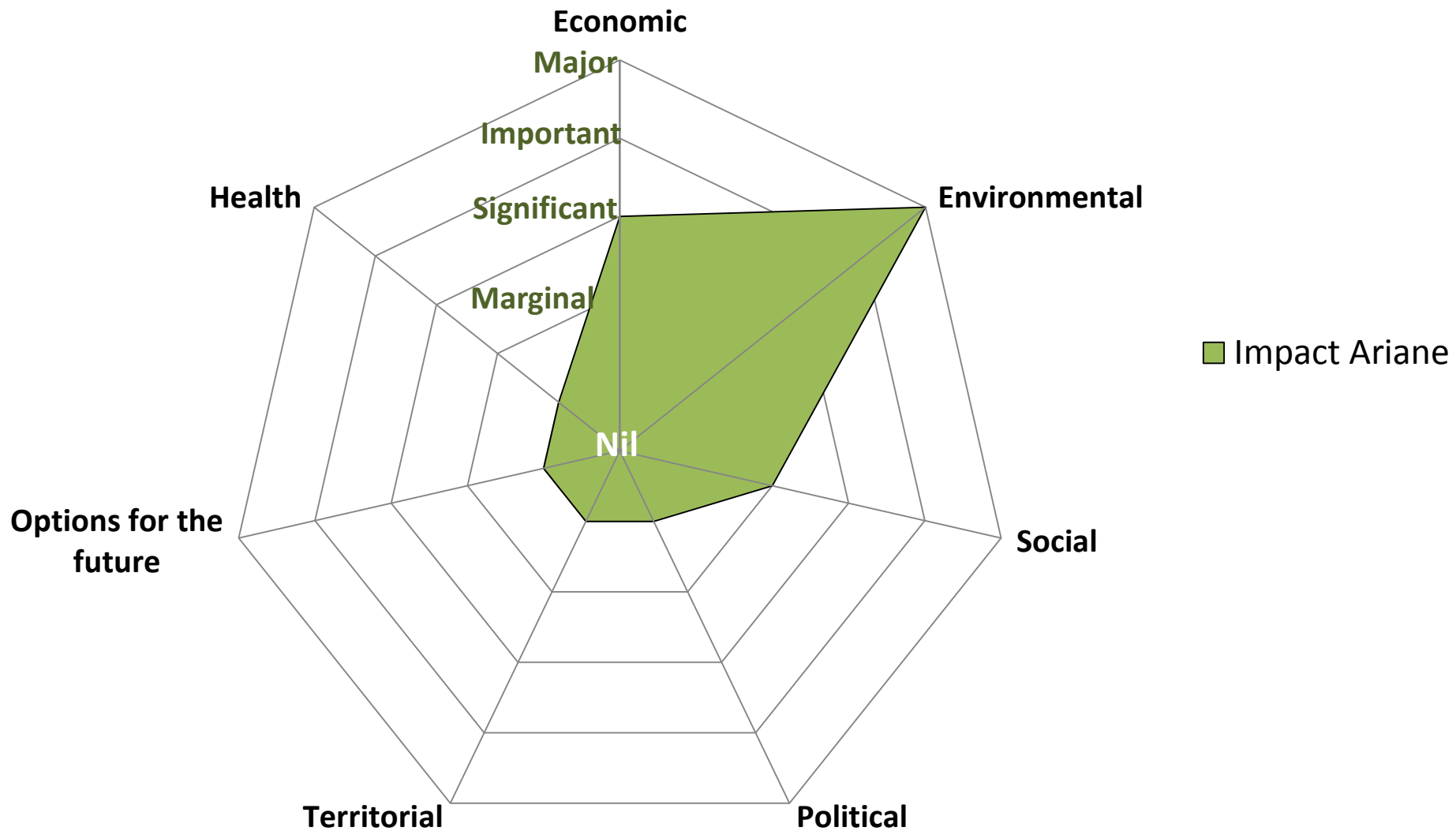


- A central notion: the ‘impact vector’
- Defining ex-ante relevant categories of impacts to consider
 - 4 ‘classical’: economic, environmental (including biodiversity), social, political
 - 3 ‘specific’ to the organisation: geographical/regional, health (human including food safety & animal), ‘insurance’ for the future (maintain a variety of options, black swan events & early warning capabilities...)
- 2-step analysis: presence & direction (positive or negative), relative importance (marginal, significant, important, major)
- An hypothesis to test: strong impacts are important for actors and drive to the development of measures (indicators) to foster their visibility
- Tools for standardising: impact table (descriptive) and radar (visualisation)

Ariane: impact vector

Impacts	presence	importance	
economic	yes	Significant (+)	500 ha grown, 1% of Apple market in France, substitution effect (Ariane instead of other Apple varieties)
environmental	yes	major	Reduction of phyto treatments between 30 and 80% →existing indicator: TFI (treatment frequency index)
social	yes	Marginal (-)?	Issues of autonomy for growers (cannot choose distribution operators and channels, need to support marketing operations decided by the operators of the brand: 'clubs' as new forms of sub-contracting?)
territorial	no		
political	no		
Health	no		
Options for the future	no		

Impact of Ariane apple



Standardised cases in practice

- Tools selected are a powerful instrument to ‘harmonise’ cases
 - open question: having them not only at the time of the evaluation, but ‘animate them’ at key turning points in the activity?
- Second-order harmonisation is required for enabling comparisons between cases:
 - ‘standardisation’ of reports - e.g. how to account for the context (scientific, institutional, economic & social) or for academic outputs
 - (under test) complement tools by tables of the data needed for case cross-cutting analyses (see below)
- Cases are time consuming (especially to triangulate information on impacts)
 - use the ‘standardisation’ to organise a two-step process: self-assessment by researchers, ‘evaluation’ to focus on validation and complementing.
- Case Reports: – a powerful tool for organisational learning?
 - build de facto new material to engage into strategic discussions (on approaches selected, on pathways selected, on types of impacts looked for and their combination...)

First lessons from cases on dynamics



- Time frames are critical
Most cases entail a long knowledge-building period (often more than one decade) for teams to be in a position to address the issues raised (whether they 'push' it -Ariane - or whether they answer to societal issues - sheep scrapie)
- The knowledge pool/community is a central aspect
 - for knowledge building (beyond and above official partnerships),
 - for researcher credibility vis-à-vis other actors involved.
- Pathways are often built-in within the research process (through partners selected, in particular firms or technical centres/extension services)
- Complementary activities (to research) are often needed in parallel with the research phase for a potential for impact to exist (standards, government regulations, expertise)

First lessons from cases: impacts

- On identifying and ‘measuring’ impacts
 - Activities looked at have de facto more than one type of impact, but in all our cases there is clearly one type that bears the core of impacts (as clearly identified by radars)
 - In nearly all cases of ‘major’ impact, clear ‘physical measures’ exist (even if debated) – with the exception of policy impacts.
- The notions of ‘first’ and ‘wider’ impacts are useful to track impacts over time,
 - especially when INRA has pioneered an approach that has generalised later (e.g. OGU case for hybrid rapeseed).
 - This notion of generalisation (getting out of the initial use/market/niche) is critical for assessing impacts

Stage 3: moving from cases to the level of the organisation

- C5- tap the richness of cases for organisational and ‘public value’ learning → cross-cutting ‘transversal’ analysis
- C6- Focus on the impact of the organisation by type of impact
- C7- Overall impacts of the organisation: the central notion of ‘profiles’
- A further consideration (outside of the present approach): How to connect with ‘monetary’ valuations

Cross-cutting ‘transversal’ analysis



- The set of cases as a learning tool.
- Two key dimensions:
 - internal organisational learning
 - clarifying accountability issues: ‘public values’ of the organisation
- Internal organisational learning:
 - mechanisms which generate impact
 - differences and similarities between high impact-generating projects with other projects located in similar INRA ‘impact configurations’
- Inductive approach of relevant ‘public value’ rationales for INRA
 - move from general expressions to ones rooted in stakeholders and policy contexts (with images enabling better understanding)

Aggregation by type of impact

- Keeping sense of content for each type of impacts (a lesson from past evaluations, e.g. AAAS 2005)
- Use cases as concrete illustrations: ‘educating role’ for audiences
- How to move from ‘case-based’ measures to overall measures of impact: focus on physical indicators
- On-going process
 - focusing on major impacts of cases and their ‘ad-hoc’ physical measures
 - organising expert panels by type of impact with 2 objectives:
 - evaluate ordinal values generated, making sense of specific physical measures
 - discuss relevance of higher level indicator (e.g. the ETP – equivalent ton of petroleum for energy issues)

Characterising the overall impact of the organisation



- Still an open issue...
- Our central assumption: the relative importance and combination of types of impact is specific to each PRO → render profiles visible and debatable is key to the measure of impacts
- A further assumption: types of measures looked for may differ depending upon the profile (e.g. one may ask for monetary measures for FhG and probably for TEP saved for French ADEME)

An initial reflection about monetary translation of impacts



- Not part of this project
- However the project is organised in a way to be an input into more productive use of the variety of existing methods – as ‘initial conditions’ for greater robustness
- In particular the approach per type of impact, enables to develop figures taking into account three aspects
 - Monetary translation of impacts requires shared consensus of the value of given physical impacts (like a lower fertilizer pressure on land)
 - Relating impacts to investments should follow CSIRO (2010) and work at organisation’s level (no disaggregation of investment by ‘project’)
 - The question of the role of the organisation in the overall network that has generated impact requires to develop specific methodologies (e.g. following the Beta approach for space research).

To conclude



- Work in progress
- Already three major results:
 - The idea that impacts are skewed and that at a given time the evaluation of an organisation should focus only on a limited number of cases is NOT discussed
 - Standardised case studies are at hand, enabling cross-cutting analysis (for organisational learning and for a better delineation of the specific rationales underlying public investment in the organisation)
 - Most cases witness one major type of impact associated with 'ad-hoc' existing measures.
- Aggregation by type of impact is now the next challenge